MANUAL TÉCNICO

INDICE

Para la configuración de Cada Nodo utilizado en la topología mostrada anteriormente, se ha realizado el uso de diferentes instrucciones que se detallan a continuación. Se utilizaron protocolos VTP, VLANS, STP, Ethernet Channel con sus variantes LACP y PAGP.

VTP

Como primera configuración se crea la configuración de las VTP utilizando los nodos

| **R1** | **S0** | **S1** | **S2** | **S3** | **S4** | **S5** |

- VLANS UTILIZADAS

VLAN	No
Ventas	11
Distribucion	21
Administracion	31
Servidores	41
Management&Native	99
BlackHole	999

- VTP SERVER - R1

  ```
  enable
  configure terminal

  vlan 11
  name VENTAS
  exit

  vlan 21
  ```

```
name DISTRIBUICION
exit

vlan 31
name ADMINISTRACION
exit

vlan 41
name SERVIDORES
exit

vlan 99
name MANAGEMENT
exit

vlan 999
name BLACKHOLE
exit

vtp domain g19
vtp password g19
vtp mode server
vtp version 2
exit

conf t
int range f0/3-4
switchport mode trunk
switchport trunk allowed vlan all
exit

sh vtp status
```

- VTP CLIENT - S0

```
enable
configure terminal
vtp domain g19
vtp password g19
vtp mode client
vtp version 2
exit

configure terminal
int f0/1
switchport mode access
switchport access vlan 11
exit

int f0/2
switchport mode access
```

```
switchport access vlan 21
exit

int f0/3
switchport mode trunk
switchport trunk allowed vlan all
exit

int range f0/5-7
switchport mode trunk
switchport trunk allowed vlan all
exit

int range f0/10-11
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/10-11
channel-group 2 mode on
exit

int port-channel 2
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/6-7
channel-group 5 mode on
exit

int port-channel 5
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- VTP CLIENT - S2

```
enable
configure terminal
vtp domain g19
vtp password g19
vtp mode client
vtp version 2
exit

configure terminal
int f0/1
switchport mode access
switchport access vlan 31
```

```
exit

int f0/2
switchport mode access
switchport access vlan 21
exit

int range f0/4-5
switchport mode trunk
switchport trunk allowed vlan all
exit

int range f0/8-9
switchport mode trunk
switchport trunk allowed vlan all
exit

int range f0/12-13
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/8-9
channel-group 1 mode on
exit

int port-channel 1
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/12-13
channel-group 3 mode on
exit

int port-channel 3
switchport mode trunk
switchport trunk allowed vlan all
exit

sh vtp status
```

- VTP CLIENT - S3

```
enable
configure terminal
vtp domain g19
vtp password g19
vtp mode client
vtp version 2
exit
```

```
configure terminal
int f0/1
switchport mode access
switchport access vlan 41
exit

int f0/2
switchport mode access
switchport access vlan 11
exit

int range f0/5-6
switchport mode trunk
switchport trunk allowed vlan all
exit

int f0/10
switchport mode trunk
switchport trunk allowed vlan all
exit

sh vtp-status
```

- VTP CLIENT - S4

```
enable
configure terminal
vtp domain g19
vtp password g19
vtp mode client
vtp version 2
exit

configure terminal
int f0/1
switchport mode access
switchport access vlan 21
exit

int f0/2
switchport mode access
switchport access vlan 31
exit

int f0/6
switchport mode trunk
switchport trunk allowed vlan all
exit
```

```
int f0/8
switchport mode trunk
switchport trunk allowed vlan all
exit

int range f0/10-13
switchport mode trunk
switchport trunk allowed vlan all
exit

int range f0/15-16
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/10-11
channel-group 2 mode on
exit

int port-channel 2
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/15-16
channel-group 4 mode on
exit

int port-channel 4
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/12-13
channel-group 3 mode on
exit

int port-channel 3
switchport mode trunk
switchport trunk allowed vlan all
exit

sh vtp-status
```

- VTP CLIENT - S5

```
enable
configure terminal
vtp domain g19
vtp password g19
vtp mode client
```

```
vtp version 2
exit

configure terminal
int f0/1
switchport mode access
switchport access vlan 11
exit

int f0/2
switchport mode access
switchport access vlan 41
exit

int f0/5
switchport mode trunk
switchport trunk allowed vlan all
exit

int f0/8
switchport mode trunk
switchport trunk allowed vlan all
exit

int f0/11
switchport mode trunk
switchport trunk allowed vlan all
exit

sh vtp-status
```

- VTP TRANSPARENT - S1

```
enable
configure terminal
vtp domain g19
vtp password g19
vtp mode transparent
vtp version 2
exit

configure terminal
int range f0/6-11
switchport mode trunk
switchport trunk allowed vlan all
exit

int range f0/15-16
switchport mode trunk
switchport trunk allowed vlan all
```

```
exit

interface range f0/6-7
channel-group 5 mode on
exit

int port-channel 5
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/15-16
channel-group 4 mode on
exit

int port-channel 4
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/8-9
channel-group 1 mode on
exit

int port-channel 1
switchport mode trunk
switchport trunk allowed vlan all
exit

sh vtp-status
```

ASIGNACION DE IP's

A cada PC-PT se le ha asignado una dirección IP la cual realiza la distinción entre cada una de las redes. Se utilizaron las VLAN's explicadas en el primero punto.

A continuacion se detalla la direccion ip, mascara de subred y gateway de cada una:

- Ventas

  - PC0

    ```
    ipconfig 192.168.11.2 255.255.255.192 192.168.11.1
    ```

  - PC4

```
ipconfig 192.168.11.3 255.255.255.192 192.168.11.1
```

- PC7

```
ipconfig 192.168.11.4 255.255.255.192 192.168.11.1
```

- Distribucion

  - PC1

```
ipconfig 192.168.11.65 255.255.255.192 192.168.11.65
```

  - PC5

```
ipconfig 192.168.11.66 255.255.255.192 192.168.11.65
```

  - PC3

```
ipconfig 192.168.11.67 255.255.255.192 192.168.11.65
```

- Administracion

  - PC6

```
ipconfig 192.168.11.130 255.255.255.192 192.168.11.129
```

  - PC2

```
ipconfig 192.168.11.131 255.255.255.192 192.168.11.129
```

- Servidores

  - SERVER0

```
ipconfig 192.168.11.194 255.255.255.192 192.168.11.193
```

- SERVER1

```
ipconfig 192.168.11.195 255.255.255.192 192.168.11.193
```

INTERVLAN's

```
enable
conf t
ip routing
int vlan 11
description Interfaz de enlace para vlan 11
ip address 192.168.11.1 255.255.255.192
no shutdown
exit

int vlan 21
description Interfaz de enlace para vlan 21
ip address 192.168.11.65 255.255.255.192
no shutdown
exit

int vlan 31
description Interfaz de enlace para vlan 31
ip address 192.168.11.129 255.255.255.192
no shutdown
exit

int vlan 41
description Interfaz de enlace para vlan 41
ip address 192.168.11.193 255.255.255.192
no shutdown
exit
```

ETHERNETCHANNEL

- PAGP

  - S0

```
interface range f0/6-7
no channel-protocol
no channel-group
```

```
exit
no interface port-channel 5


interface range f0/10-11
no channel-protocol
no channel-group
exit
no interface port-channel 2

interface range f0/6-7
channel-protocol pagp
channel-group 5 mode desirable
exit

interface range f0/10-11
channel-protocol pagp
channel-group 2 mode desirable
exit

interface range f0/10-11
channel-group 2 mode on
exit

int port-channel 2
switchport mode trunk
switchport trunk allowed vlan all
exit

interface range f0/6-7
channel-group 5 mode on
exit

int port-channel 5
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- S1

```
interface range f0/8-9
no channel-protocol
no channel-group
exit
no interface port-channel 1

interface range f0/15-16
no channel-protocol
no channel-group
exit
no interface port-channel 4
```

```
interface range f0/6-7
no channel-protocol
no channel-group
exit
no interface port-channel 5


interface range f0/8-9
channel-protocol pagp
channel-group 1 mode desirable
exit

interface range f0/15-16
channel-protocol pagp
channel-group 4 mode desirable
exit

interface range f0/6-7
channel-protocol pagp
channel-group 5 mode desirable
exit

int port-channel 1
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 4
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 5
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- S2

```
interface range f0/8-9
no channel-protocol
no channel-group
exit
no interface port-channel 1

interface range f0/12-13
no channel-protocol
no channel-group
exit
no interface port-channel 3
```

```
interface range f0/8-9
channel-protocol pagp
channel-group 1 mode desirable
exit

interface range f0/12-13
channel-protocol pagp
channel-group 3 mode desirable
exit



int port-channel 1
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 3
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- S4

```
interface range f0/10-11
no channel-protocol
no channel-group
exit
no interface port-channel 2

interface range f0/12-13
no channel-protocol
no channel-group
exit
no interface port-channel 3

interface range f0/15-16
no channel-protocol
no channel-group
exit
no interface port-channel 4



interface range f0/10-11
channel-protocol pagp
channel-group 2 mode desirable
exit

interface range f0/12-13
channel-protocol pagp
```

```
channel-group 3 mode desirable
exit

interface range f0/15-16
channel-protocol pagp
channel-group 4 mode desirable
exit



int port-channel 2
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 3
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 4
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- LACP

    - S0

```
interface range f0/6-7
no channel-protocol
no channel-group
exit
no interface port-channel 5

interface range f0/10-11
no channel-protocol
no channel-group
exit
no interface port-channel 2


interface range f0/6-7
channel-protocol lacp
channel-group 5 mode active
exit

interface range f0/10-11
channel-protocol lacp
channel-group 2 mode active
exit
```

```
int port-channel 2
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 5
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- S1

```
interface range f0/8-9
no channel-protocol
no channel-group
exit
no interface port-channel 1

interface range f0/15-16
no channel-protocol
no channel-group
exit
no interface port-channel 4

interface range f0/6-7
no channel-protocol
no channel-group
exit
no interface port-channel 5


interface range f0/8-9
channel-protocol lacp
channel-group 1 mode active
exit

interface range f0/15-16
channel-protocol lacp
channel-group 4 mode active
exit

interface range f0/6-7
channel-protocol lacp
channel-group 5 mode active
exit

int port-channel 1
switchport mode trunk
switchport trunk allowed vlan all
```

```
exit

int port-channel 4
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 5
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- S2

```
interface range f0/8-9
no channel-protocol
no channel-group
exit
no interface port-channel 1

interface range f0/12-13
no channel-protocol
no channel-group
exit
no interface port-channel 3



interface range f0/8-9
channel-protocol lacp
channel-group 1 mode active
exit

interface range f0/12-13
channel-protocol lacp
channel-group 3 mode active
exit



int port-channel 1
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 3
switchport mode trunk
switchport trunk allowed vlan all
exit
```

- ○ S4

```
interface range f0/10-11
no channel-protocol
no channel-group
exit
no interface port-channel 2

interface range f0/12-13
no channel-protocol
no channel-group
exit
no interface port-channel 3

interface range f0/15-16
no channel-protocol
no channel-group
exit
no interface port-channel 4


interface range f0/10-11
channel-protocol lacp
channel-group 2 mode active
exit

interface range f0/12-13
channel-protocol lacp
channel-group 3 mode active
exit

interface range f0/15-16
channel-protocol lacp
channel-group 4 mode active
exit


int port-channel 2
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 3
switchport mode trunk
switchport trunk allowed vlan all
exit

int port-channel 4
switchport mode trunk
switchport trunk allowed vlan all
exit
```

PRUEBAS CONVERGENCIA

Escenario	EtherChannel	STP	Tiempo	Cantidad TimeOuts
1	LACP	PVST	59.87 s	6
2	LACP	Rapid PVST	1 ms	0
3	PAGP	PVST	59.87 s	6
4	PAGP	Rapid PVST	14.1 s	2

SUBREDES FLSM

Subred	No Hosts	Ip	Mascara	Primer Host	Ultimo Host	Broadcast
1	62	192.168.11.0 /26	255.255.255.192	192.168.11.1	192.168.11.62	192.168.11.63
2	62	192.168.11.64 /26	255.255.255.192	192.168.11.65	192.168.11.126	192.168.11.127
3	62	192.168.11.128 /26	255.255.255.192	192.168.11.129	192.168.11.190	192.168.11.191
4	62	192.168.11.192 /26	255.255.255.192	192.168.11.193	192.168.11.254	192.168.11.255

EXPLICACIONES

- VTP

```
Para la creacion de las VLAN Trunking Protocol (VTP) se utilizo el router R1
donde fueron creadas las distintas VLANS's y caminos a seguir para cada
host.
```

- SUBNETING

```
Se utilizo para la creacion de Subredes, la mascara de subred de direccion
fisica conocida como FLSM en la cual se detallan la cantidad de hosts a
utilizar, direccion ip, mascara de subred, primer host, ultimo host y la
direccion de broadcast; permitiendo de esta manera una comunicacion entre
los dispositivos pertenecientes a la misma red.
```

- CONVERGENCIA

> Nuestro mejor tipo fue LACP y nuestro protocolo RAPID PVST, al usar ésta
> configuración no se recibió ningún timeout, por ésto definimos que para ésta
> topología es muy eficiente dejar estos tipos de protocolos.

SEGURIDAD

- S0

```
--- TRUNK
  interface f0/3
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface range f0/5-7
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface range f0/10-11
  switchport mode trunk
  switchport trunk native vlan 99
  exit

--- ACCESS
  interface f0/4
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/8-9
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/12-24
  switchport mode access
  switchport access vlan 999
  exit

--- SECURITY
  interface f0/1
  switchport port-security mac-address sticky
  switchport port-security maximum 5

  interface f0/2
  switchport port-security mac-address sticky
  switchport port-security maximum 1
  switchport port-security violation shutdown
```

- S1

```
--- TRUNK
  interface range f0/6-11
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface range f0/15-16
  switchport mode trunk
  switchport trunk native vlan 99
  exit

--- ACCESS
  interface range f0/1-5
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/12-14
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/17-24
  switchport mode access
  switchport access vlan 999
  exit
```

- S2

```
--- TRUNK
  interface range f0/4-5
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface range f0/8-9
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface range f0/12-13
  switchport mode trunk
  switchport trunk native vlan 99
  exit

--- ACCESS
  interface f0/3
  switchport mode access
```

```
    switchport access vlan 999
    exit

    interface range f0/6-7
    switchport mode access
    switchport access vlan 999
    exit

    interface range f0/10-11
    switchport mode access
    switchport access vlan 999
    exit

    interface range f0/14-24
    switchport mode access
    switchport access vlan 999
    exit

--- SECURITY
    interface f0/1
    switchport port-security mac-address sticky
    switchport port-security maximum 1
    switchport port-security violation shutdown

    interface f0/2
    switchport port-security mac-address sticky
    switchport port-security maximum 1
    switchport port-security violation shutdown
```

- S3

```
  --- TRUNK
    interface range f0/5-6
    switchport mode trunk
    switchport trunk native vlan 99
    exit

    interface f0/10
    switchport mode trunk
    switchport trunk native vlan 99
    exit
--- ACCESS
    interface range f0/3-4
    switchport mode access
    switchport access vlan 999
    exit

    interface range f0/7-9
    switchport mode access
    switchport access vlan 999
    exit
```

```
  interface range f0/11-24
  switchport mode access
  switchport access vlan 999
  exit

-- SECURITY
  interface f0/2
  switchport port-security mac-address sticky
  switchport port-security maximum 5
```

- S4

```
--- TRUNK
  interface f0/6
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface f0/8
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface range f0/10-13
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface range f0/15-16
  switchport mode trunk
  switchport trunk native vlan 99
  exit

--- ACCESS
  interface range f0/3-5
  switchport mode access
  switchport access vlan 999
  exit

  interface f0/7
  switchport mode access
  switchport access vlan 999
  exit

  interface f0/9
  switchport mode access
  switchport access vlan 999
  exit
```

```
  interface f0/14
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/17-24
  switchport mode access
  switchport access vlan 999
  exit

--- SECURITY
  interface f0/1
  switchport port-security mac-address sticky
  switchport port-security maximum 1
  switchport port-security violation shutdown

  interface f0/2
  switchport port-security mac-address sticky
  switchport port-security maximum 1
  switchport port-security violation shutdown
```

- S4

```
--- ACCESS
  interface f0/5
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface f0/8
  switchport mode trunk
  switchport trunk native vlan 99
  exit

  interface f0/11
  switchport mode trunk
  switchport trunk native vlan 99
  exit
--- ACCESS
  interface range f0/3-4
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/6-7
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/9-10
```

```
  switchport mode access
  switchport access vlan 999
  exit

  interface range f0/12-24
  switchport mode access
  switchport access vlan 999
  exit
--- SECURITY
  interface f0/1
  switchport port-security mac-address sticky
  switchport port-security maximum 5
```